

§ 23.1013

14 CFR Ch. I (1–1–08 Edition)

this part are more severe, substantiation must be shown to the requirements of subpart E of this part.

(b) Each engine must have an independent oil system that can supply it with an appropriate quantity of oil at a temperature not above that safe for continuous operation.

(c) The usable oil tank capacity may not be less than the product of the endurance of the airplane under critical operating conditions and the maximum oil consumption of the engine under the same conditions, plus a suitable margin to ensure adequate circulation and cooling.

(d) For an oil system without an oil transfer system, only the usable oil tank capacity may be considered. The amount of oil in the engine oil lines, the oil radiator, and the feathering reserve, may not be considered.

(e) If an oil transfer system is used, and the transfer pump can pump some of the oil in the transfer lines into the main engine oil tanks, the amount of oil in these lines that can be pumped by the transfer pump may be included in the oil capacity.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23–43, 58 FR 18973, Apr. 9, 1993]

§ 23.1013 Oil tanks.

(a) *Installation.* Each oil tank must be installed to—

(1) Meet the requirements of § 23.967 (a) and (b); and

(2) Withstand any vibration, inertia, and fluid loads expected in operation.

(b) *Expansion space.* Oil tank expansion space must be provided so that—

(1) Each oil tank used with a reciprocating engine has an expansion space of not less than the greater of 10 percent of the tank capacity or 0.5 gallon, and each oil tank used with a turbine engine has an expansion space of not less than 10 percent of the tank capacity; and

(2) It is impossible to fill the expansion space inadvertently with the airplane in the normal ground attitude.

(c) *Filler connection.* Each oil tank filler connection must be marked as specified in § 23.1557(c). Each recessed oil tank filler connection of an oil tank used with a turbine engine, that can retain any appreciable quantity of oil,

must have provisions for fitting a drain.

(d) *Vent.* Oil tanks must be vented as follows:

(1) Each oil tank must be vented to the engine from the top part of the expansion space so that the vent connection is not covered by oil under any normal flight condition.

(2) Oil tank vents must be arranged so that condensed water vapor that might freeze and obstruct the line cannot accumulate at any point.

(3) For acrobatic category airplanes, there must be means to prevent hazardous loss of oil during acrobatic maneuvers, including short periods of inverted flight.

(e) *Outlet.* No oil tank outlet may be enclosed by any screen or guard that would reduce the flow of oil below a safe value at any operating temperature. No oil tank outlet diameter may be less than the diameter of the engine oil pump inlet. Each oil tank used with a turbine engine must have means to prevent entrance into the tank itself, or into the tank outlet, of any object that might obstruct the flow of oil through the system. There must be a shutoff valve at the outlet of each oil tank used with a turbine engine, unless the external portion of the oil system (including oil tank supports) is fireproof.

(f) *Flexible liners.* Each flexible oil tank liner must be of an acceptable kind.

(g) Each oil tank filler cap of an oil tank that is used with an engine must provide an oiltight seal.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23–15, 39 FR 35459 Oct. 1, 1974; Amdt. 23–43, 58 FR 18973, Apr. 9, 1993; Amdt. 23–51, 61 FR 5137, Feb. 9, 1996]

§ 23.1015 Oil tank tests.

Each oil tank must be tested under § 23.965, except that—

(a) The applied pressure must be five p.s.i. for the tank construction instead of the pressures specified in § 23.965(a);

(b) For a tank with a nonmetallic liner the test fluid must be oil rather than fuel as specified in § 23.965(d), and the slosh test on a specimen liner must be conducted with the oil at 250 °F.; and

(c) For pressurized tanks used with a turbine engine, the test pressure may not be less than 5 p.s.i. plus the maximum operating pressure of the tank.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23-15, 39 FR 35460, Oct. 1, 1974]

§ 23.1017 Oil lines and fittings.

(a) *Oil lines.* Oil lines must meet § 23.993 and must accommodate a flow of oil at a rate and pressure adequate for proper engine functioning under any normal operating condition.

(b) *Breather lines.* Breather lines must be arranged so that—

(1) Condensed water vapor or oil that might freeze and obstruct the line cannot accumulate at any point;

(2) The breather discharge will not constitute a fire hazard if foaming occurs, or cause emitted oil to strike the pilot's windshield;

(3) The breather does not discharge into the engine air induction system; and

(4) For acrobatic category airplanes, there is no excessive loss of oil from the breather during acrobatic maneuvers, including short periods of inverted flight.

(5) The breather outlet is protected against blockage by ice or foreign matter.

[Doc. No. 4080, 29 FR 17955, Dec. 18, 1964, as amended by Amdt. 23-7, 34 FR 13094, Aug. 13, 1969; Amdt. 23-14, 38 FR 31823, Nov. 19, 1973]

§ 23.1019 Oil strainer or filter.

(a) Each turbine engine installation must incorporate an oil strainer or filter through which all of the engine oil flows and which meets the following requirements:

(1) Each oil strainer or filter that has a bypass, must be constructed and installed so that oil will flow at the normal rate through the rest of the system with the strainer or filter completely blocked.

(2) The oil strainer or filter must have the capacity (with respect to operating limitations established for the engine) to ensure that engine oil system functioning is not impaired when the oil is contaminated to a degree (with respect to particle size and density) that is greater than that estab-

lished for the engine for its type certification.

(3) The oil strainer or filter, unless it is installed at an oil tank outlet, must incorporate a means to indicate contamination before it reaches the capacity established in accordance with paragraph (a)(2) of this section.

(4) The bypass of a strainer or filter must be constructed and installed so that the release of collected contaminants is minimized by appropriate location of the bypass to ensure that collected contaminants are not in the bypass flow path.

(5) An oil strainer or filter that has no bypass, except one that is installed at an oil tank outlet, must have a means to connect it to the warning system required in § 23.1305(c)(9).

(b) Each oil strainer or filter in a powerplant installation using reciprocating engines must be constructed and installed so that oil will flow at the normal rate through the rest of the system with the strainer or filter element completely blocked.

[Amdt. 23-15, 39 FR 35460, Oct. 1, 1974, as amended by Amdt. 23-29, 49 FR 6847, Feb. 23, 1984; Amdt. 23-43, 58 FR 18973, Apr. 9, 1993]

§ 23.1021 Oil system drains.

A drain (or drains) must be provided to allow safe drainage of the oil system. Each drain must—

(a) Be accessible;

(b) Have drain valves, or other closures, employing manual or automatic shut-off means for positive locking in the closed position; and

(c) Be located or protected to prevent inadvertent operation.

[Amdt. 23-29, 49 FR 6847, Feb. 23, 1984, as amended by Amdt. 23-43, 58 FR 18973, Apr. 9, 1993]

§ 23.1023 Oil radiators.

Each oil radiator and its supporting structures must be able to withstand the vibration, inertia, and oil pressure loads to which it would be subjected in operation.

§ 23.1027 Propeller feathering system.

(a) If the propeller feathering system uses engine oil and that oil supply can become depleted due to failure of any part of the oil system, a means must be